

## Remarks

Please enter the amendments as shown. The amendment to claim 1, regarding the insertion of the phrase "pasteurizing the phytase treated protein material at 305°F has support, *inter alia*, on page 16, lines 18-20. The amendment to claim 17, regarding the insertion of the phrase "pasteurizing the phytase treated protein material at 305°F has support, *inter alia*, on page 17, lines 10-13. The amendment to claim 33, regarding the insertion of the phrase "pasteurizing the phytase treated protein material at 305°F has support, *inter alia*, on page 17 line 31 to page 18 line 2. The amendment to claims 1, 17, and 33 regarding the insertion of the phrase "comprising a polysaccharide hydrolysate" can be found, *inter alia*, in canceled claims 12, 28, and 44. The remaining amendments to claims 1, 17, and 33 to remove the characters "(1)" to "(6)" are to improve the readability of these claims. The amendments to claims 5-7, 21-23, and 37-39 are to improve readability. Upon entry of this amendment, the pending claims are 1-11, 13-27, 29-43, and 45-48.

## Rejection Under 35 USC §102(e)

Claims 1-48 are rejected under 35 USC §102(e) as being anticipated by Shen (U.S. Patent Application No US 2004/0258827).

Within the Office Action is stated:

It is expected that one or more of the protein isolate products set forth in paragraph 30 of Shen have a removed or reduced phytate content as called for in the instant claims. It is requested that Applicant submit evidence to corroborate the presumed reduced phytic content in these commercial products....

Submitted with this response is a declaration of Theodore M. Wong under 37 CFR §1.132 stating that the phytic acid content of the protein isolate products from paragraph 30 of Shen have at a minimum 1.5% phytic acid, which is equivalent to 23  $\mu\text{mol/g}$  protein. Reconsideration and withdrawal of this ground of rejection is respectfully requested.

Claims 1-11, 15-27, 31-43, 47, and 48 are rejected under 35 USC §102(e) as being anticipated by Huang (US 6,887,508).

Huang teaches a protein stabilizing agent composition for stabilizing protein in an aqueous acidic liquid comprising a high methoxyl pectin and a propylene glycol alginate. Huang does not teach a protein stabilizing agent comprising a polysaccharide hydrolysate as do the present independent claims 1, 17 and 33.

Further, within the Office Action it is stated:

It is expected that Supro Plus 675 set forth in col. 15 of Huang has a removed or reduced phytate content as called for in the instant claims. It is requested that Applicant submit evidence to corroborate the presumed reduced phytic content in these commercial products....

Submitted with this response is the declaration of Theodore M. Wong under 37 CFR §1.132 stating that the phytic acid content of Supro Plus 675 has at a minimum 1.5% phytic acid, which is equivalent to 23  $\mu\text{mol/g}$  protein. Reconsideration and withdrawal of this ground of rejection is respectfully requested.

#### **Rejection Under 35 USC §103(a)**

Claims 1-48 are rejected under 35 USC §103(a) as being unpatentable over Shen (US Patent Application Publication No. 2004/0258827) taken together with EP 380343. The declaration of Theodore M. Wong shows that the starting material soy protein isolates of Shen contain a minimum 1.5% phytic acid, which is equivalent to 23  $\mu\text{mol/g}$  protein.

The present invention is directed to a process for preparing a soy protein material having a phytic acid content of less than 8.0  $\mu\text{mol/g}$  protein as demonstrated by three different process.

#### **Process 1, as defined by claims 1-16:**

Defatted soybean flakes are mixed with water in a water to flakes ratio of 10:1. The contents are heated to 90°F and calcium hydroxide is added to adjust the pH to 9.7. The flakes are separated from the extract and the extracted flakes are reextracted with 600 lbs. of water having a pH of 9.7 and a temperature of 90°F at a water to flakes ratio of 6:1. The spent flakes are removed by centrifugation and discarded, and the first and second extracts are combined and adjusted to a pH of 4.5 with a mineral acid, which forms a precipitated protein curd and a soluble aqueous whey. The curd is separated from the whey and the curds are re-suspended in water at a 10-12% solid concentration and the pH is adjusted to 3.5-6 with sodium hydroxide to partially

solubilize the protein curds. A Finase<sup>®</sup> S phytase is added to the partially solubilized curd at 720 PU/g and the contents are held at 110°F. for 1 hr while stirring. The partially solubilized curd suspension is then pasteurized at 305°F. for 9 sec and spray dried to provide a protein isolate with a reduced phytic acid content of 5.8  $\mu\text{mol/g}$  protein.

Process 2, as defined by claims 17-32:

Defatted soybean flakes are mixed with water in a water to flakes ratio of 10:1. The contents are heated to 90°F and calcium hydroxide is added to adjust the pH to 9.7. The flakes are separated from the extract and the extracted flakes are reextracted with 600 lbs. of water having a pH of 9.7 and a temperature of 90°F at a water to flakes ratio of 6:1. The spent flakes are removed by centrifugation and discarded, and the first and second extracts are combined. A Finase<sup>®</sup> S phytase is added to the combined extract at 720 PU/g protein and the temperature is held at 110°F for 1 hour. A mineral acid is added to adjust the pH to 5.1 which forms a precipitated protein curd and a soluble aqueous whey. The curd is separated from the whey and the curds are re-suspended in water at a 10-12% solid concentration and the pH is adjusted to 7.0 with sodium hydroxide to solubilize the protein and then pasteurized at 305°F. for 9 sec and spray dried to provide a protein isolate with a reduced phytic acid content of 0.18  $\mu\text{mol/g}$  protein.

Process 3, as defined by claims 33-48:

Defatted soybean flakes are mixed with water in a water to flakes ratio of 10:1. The contents are heated to 90°F and calcium hydroxide is added to adjust the pH to 9.7. The flakes are separated from the extract and the wet flakes are reextracted with 600 lbs. of water having a pH of 9.7 and a temperature of 90°F at a water to flakes ratio of 6:1. The spent flakes are removed by centrifugation and discarded, and the first and second extracts are combined and adjusted to a pH of 4.5 with a mineral acid, which forms a precipitated protein curd and a soluble aqueous whey. The curd is separated from the whey and the curds are re-suspended in water at a 10-12% solid concentration and the pH is adjusted to 6.7 to 7.4 with sodium hydroxide to solubilize the protein curds. A phytase is added to the protein solution at 0.25% CSB and the contents are held at 110°F. for 1 hr with stirring. The protein solution is then pasteurized at 305°F. for 9 sec and spray dried to provide a protein isolate with a reduced phytic acid content.

It is noted that EP 380343 has 8 different aspects. Aspects 1, 3, and 5 all utilize a soy protein isolate or a soy protein concentrate as a starting material. Within the present invention, the starting material is a protein containing plant material of soy flakes and not a soy protein isolate or a soy protein concentrate.

In Aspect 2, the phytate degrading enzyme is added to a soy bean water slurry as per the present Process 2. In Aspect 2 the pH is then lowered to between 2-6. Present Process 2 lowers the pH to 4-5.5 to precipitate protein. It must be assumed that within Aspect 2, that when the pH is lowered that protein is precipitated. In Aspect 2 the phytate-free soy protein is then isolated at this pH. In Process 2, the curd formed after precipitation is separated, and the pH of the slurry is adjusted to between 6.7-7.4, in which the protein becomes soluble. The solution is spray dried to give the claimed product. There is no pasteurization step in Aspect 2.

In Aspect 4, the soy protein is water extracted. Since no pH conditions are given, it must be assumed that no pH adjustment is made. In Processes 1, 2, and 3, the pH is adjusted during extraction to about 9.7 with calcium hydroxide, which increases the solubility of the protein. In Aspect 4, the pH of the suspension is lowered to between 2-6. However, there is no separation step of curds and whey as per present Process 1 when the pH is lowered to 3.5. In Aspect 4, phytase is added with the temperature held between 20-50°C. This is similar to present Process 1. In Aspect 4, after enzyme incubation, the pH is adjusted to 9 and in present Process 1, the pH is adjusted to 3.5, followed by phytase addition and further followed by a pasteurization step. There is no pasteurization step in Aspect 4.

In Aspect 6, the soy protein is water extracted at a pH of 8-10, insoluble material is removed and the pH is then adjusted to 2-6 to separate the protein, followed by phytase addition and incubation to give the phytate-free soy protein isolate. This is similar to present Process 1. However, present Process 1 has a pasteurization step not included in Aspect 6.

Aspect 7 is similar to Aspect 6, except in Aspect 7, after phytase incubation, the pH is lowered to the isoelectric point of the protein and the protein is separated to give the phytate-free soy protein isolate. This further lowering of the pH is not present in present Process 1 and present Process 1 has a pasteurization step not included in Aspect 7.

In Aspect 8, the soy protein is water extracted at a pH of 8-10, insolubles are removed, the pH is adjusted to precipitate protein, the precipitated protein is separated and redispersed in

water. This is similar to present Processes 1 and 3. However, in Aspect 8, the pH is then adjusted to 5.5 followed by phytase addition, incubation, neutralization, and spray drying. Present Processes 1 and 3 do not follow these steps. In present Process 1, after the protein is redispersed in water, the pH is lowered to 3.5, followed by phytase addition, incubation, pasteurization, and spray drying. In present Process 3, after the protein is redispersed in water, the pH is adjusted to 6.7-7.4, followed by phytase addition, incubation, pasteurization and spray drying.

It is interesting to note that EP 380343 puts forth 8 different aspects for reducing phytates. However, these 8 different aspects do not teach any of the 3 processes of the present invention. Further, the claims as amended employ a pasteurization step at 305°F (151°C). Within the 8 different aspects of EP 380343, the highest temperature is 65°C in the sixth aspect. On page 6 at lines 6-8, EP 380343 teaches that exposing the soy protein above 65°C adversely affects the solubility and other functional properties of the soy protein product. EP 380343 clearly teaches away from the present invention.

None of the Aspects of EP 380343 when combined with Shen cause the present invention to be obvious. Reconsideration and withdrawal of this ground of rejection is respectfully requested.

Claims 1-11, 15-27, 31-43, 47, and 48 are rejected under 35 USC §103(a) as being unpatentable over Huang (US 6,887,508) taken together with EP 380343. The declaration of Theodore M. Wong shows that the starting material soy protein isolates of Huang contain a minimum 1.5% phytic acid, which is equivalent to 23  $\mu\text{mol/g}$  protein.

EP 380343 is discussed above. None of the Aspects of EP 380343 when combined with Huang cause the present invention to be obvious. Reconsideration and withdrawal of this ground of rejection is respectfully requested.

Claims 1-48 are rejected under 35 USC §103(a) as being unpatentable over Patel et al. taken together with EP 380343. Patel et al. is directed to the preparation of a beverage employing a soy protein having an isoflavones level of from 0.5 mg isoflavone per gram of soy

protein, a stabilizing agent and vegetable/fruit juices. The pH of the beverage is about 4. Patel et al. is silent on the phytic acid level of the soy protein.

EP 380343 is cited for its teaching of low phytic acid soy proteins. However, given the short comings of Patel et al and the short comings of EP 380343, combining the teachings of Patel et al. with EP 380343, as urged in the Office Action, does not render the present claims as obvious. Reconsideration and withdrawal of this ground of rejection is respectfully requested.

Claims 1-48 are rejected under 35 USC §103(a) as being unpatentable over EP 1,338,210 taken together with EP 380343. EP 1,338,210 is a counterpart of US 6,887,508 – Huang discussed above. As such, a response to this rejection is stated above in the discussion of Huang taken together with EP 380383. Reconsideration and withdrawal of this ground of rejection is respectfully requested.

#### Double Patenting

Claims 1-48 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 of copending Application NO. 10/825,528 in view of EP 380,343. Submitted herewith is a terminal disclaimer in compliance with 37 CFR 1.321(c). Reconsideration and withdrawal of this ground of rejection is respectfully requested.

For the foregoing reasons, it is submitted that the present claims are in condition for allowance. The foregoing remarks are believed to be a full and complete response to the outstanding office action. Therefore favorable reconsideration and allowance are respectfully requested. If for any reason the Examiner believes a telephone conference would expedite the prosecution of this application, it is respectfully requested that she call Applicant's representative at 314.982.2409.

If any additional fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to our Deposit Account No. 50-0421.

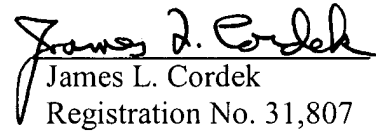
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